REMARKS

Applicants respectfully request reconsideration and allowance of all pending claims.

Applicants also request an initialed copy of their IDS submitted in December 2006.

I. **Status of the Claims**

Upon entry of this amendment, claims 48, 49, 52, 53, 59, and 61 remain pending. Claim 66 is new. Accordingly, claims 48, 49, 52, 53, 59, 61, and 66 are pending.

Claims 48 and the dependent claims are amended to claim a particular embodiment of the invention. The following amendments to claim 48 are supported in applicants' specification:

the deposition rate at [0027]

the anion of the metal base salt at [0014]

the complexing agent at [0016]

the pH range at [0051]-[0051]

the self-regulating behavior of the electrolyte at [0024]

optionally components phosphorus, additional metals, and finely divided particles are co-deposited at [0018], 0037], and claim 24.

The amendments to the dependent claims are made for consistency with the amendments to claim 48 or to further clarify the claimed embodiments.

Applicants' specification at [0019] supports new claim 66.

II. **Specification**

In response to the objection to the amendment to page 6 of the specification submitted in the amendment filed December 30, 2003, applicants' submit that the correction is supported by the original specification filed on October 2003 (page 9, emphasis added):

> Die Ausganskonzentration der Metallbasissaize liegt bezogen auf Nickel ***bei 0,04 bis 0,16 mol/l***, vorzugsweise ***bei 0,048 bis 0,105 mol/l***, wobei der Gehalt an Metall zwischen 0,068 bis 0,192 mol/l, vorzugsweise bei 0,085 mol/l leigt.

This provides support for the correction to "0.16 mol/L" and "0,048" as of the filing date of the present application. [While this differs from the priority document in that the priority document displays the concentrations in g/L rather than mol/L, it nonetheless provides support as of applicants' filing date.]

The requested amendment to replace Example 1 with the provided Table is also supported in the priority document. See the Table at page 13 of the application as originally filed in German. This Table also appears at page 11 of the priority document. Accordingly, the requested amendment to page 10 is also supported, and applicants request that the objection be withdrawn.

III. Claim Rejections Under 35 U.S.C. §112, second paragraph

Claims 50, 57, and 58 have been canceled, rendering this rejection moot.

IV. Claim Rejections Under 35 U.S.C. §103(a)

(A) Claims 48-53 and 59-61 over GB 1,243,134

Reconsideration is requested of the rejection of claims 48-53 and 59-61 over GB 1,243,134.

Claim 48 is directed to a method for electroless deposition of a nickel layer with internal compressive stress on a substrate. In relevant part, the method comprises:

> contacting the substrate with an electrolyte comprising a nickel metal base salt, a reducing agent, a complexing agent, an accelerator, and a stabilizer to thereby electrolessly deposit the uniform metal layer with internal compressive stress on the substrate, wherein
> ... the nickel metal base salt of the electrolyte comprises an anion selected from the group consisting of acetate, formate, nitrate, oxalate, propionate, citrate, ascorbate, and combinations thereof;
> ... the complexing agent is selected from the group consisting of 2-hydroxypropanoic acid, propanedioic acid, and a combination thereof;
> ... the electrolyte is buffered to a self-regulating pH between about 4.3 and about 6.2...

The electroless deposition method defined by claim 48 employs an electrolyte comprising particular anions of the metal base salt and complexing agents wherein the pH of the electrolyte is self-regulating. By "self-regulating," it is meant that, once the desired pH is achieved by the addition of buffering agents, during electroless deposition, "it is possible to avoid continuous monitoring of pH as well as the addition of alkali additives." See [0024] of applicant's specification as published under number 2004/0144285. The self-regulating behavior of the electrolyte depends, in part, upon the choice of metal base salt anions, as further discussed in applicants' specification at [0024]:

> As already described above, metal salts whose anions are volatile are advantageously used as metal recipient. One or more salts from the group consisting of metal acetates, metal formates, metal nitrates, metal oxalates, metal propionates, metal citrates, and metal ascorbates, especially preferably only metal acetate, are used as metal salts. Since during the reaction the pH decreases due to the continuous formation of H^+ ions and it must be kept in the set range in a costly way by means of alkali media such as a hydroxide, carbonate or, as is usually preferred, by

> ammonia, there is particular advantage in the sole use of metal salts whose anions are volatile and that preferably derive from the group consisting of the acetates, formates, nitrates, oxalates, propionates, citrates and ascorbates. ***This is based on the fact that in the deposition of the metal-phosphorus layers anions of the acetates, formates, nitrates, oxalates, propionates, citrates and ascorbates are formed, which react with the sodium carbions [sic; possibly, cations] from the sodium hypophosphite to form basic sodium salts.*** The electrolyte in accordance with the invention thus operates during the entire deposition process in a pH range from 4.0 to 5.2, preferably 4.3 to 4.8, ***without having to add large amounts of alkali media.***

This self-regulating aspect of applicants' invention is advantageous from (1) a metrology standpoint in that operators do not have to continuously monitor the electrolyte pH, (2) a cost standpoint in that the use of additional buffering agents is avoided, and (3) an environmental standpoint in that waste electrolyte is not as heavily concentrated in ions compared to waste electrolyte from conventional electroless plating methods.

GB 1,243,134 discloses a method for electroless deposition of nickel-phosphorus layers from an electroless deposition composition. Its composition comprises nickel ions, a source of hypophosphite as a reducing agent, and glutamic acid as a complexing agent. See page 2, lines 9-24 and 46-56. The bath can optionally contain exultants such as succinic acid, ammonium, and thiocyanate. The reference's exemplary bath is shown as Example 2 on page 5 of the reference. GB 1,243,134 does not disclose claim 48's specific complexing agents nor does it disclose the self-regulating pH aspect of claim 48's electrolyte.

As explained more fully below, the cited reference fails to render claim 48 obvious because a) it does not disclose all of the elements of claim 48, and b) it in fact teaches away from the self-regulating aspect of the electrolyte used in the method of claim 48, as further explained herein below. For these reasons, applicants submit that GB 1,243,134 does not render the method defined by claim 48 obvious.

More particularly, the cited reference does not disclose all of the elements of claim 48. According to criteria developed within the context of the *Graham* factual inquiries for establishing the *prima facie* obviousness of a claim, a claim is non-obvious in view of prior art that fails to disclose all of the claim limitations. See MPEP §2143.03:

> **2143.03 All Claim Limitations Must Be Taught or Suggested**
> To establish *prima facie* obviousness of a claimed invention, ***all the claim limitations must be taught or suggested by the prior art***. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under **35 U.S.C. 103**, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

GB 1,243,134 does not disclose all of the requirements of claim 48. In one aspect, GB 1,243,134 does not disclose the complexing agents 2-hydroxypropanoic acid or propanedioic acid specifically required by claim 48. [These complexing agents had appeared in now-canceled claim 60.] As discussed above, GB 1,243,134 discloses glutamic acid or glutamate salts for use as the complexing agent. The reference additionally discusses the use of succinic acid, ammonium, and thiocyanate as exultants. However, the reference does not disclose or suggest applicants' expressly required 2-hydroxypropanoic acid or propanedioic acid.

In another aspect, GB 1,243,134 does not disclose or suggest, and in fact teaches away from, claim 48's self-regulating pH. The Supreme Court affirmed in the recent issued *KSR International v. Teleflex Inc.*, 2007 WL 1237837 (U.S.), 82 U.S.P.Q.2d 1385 at *12, the holding of *United States v. Adams*, 383 U.S. 39 (1996):

> The Court relied on the corollary principle that ***when the prior art teaches away*** from combining certain known elements, discovery of a successful means of combining them ***is more likely to be nonobvious***.

The GB 1,243,134 reference teaches away from applicants' self regulating electrolyte pH at, for example, page 2, lines 117-127:

> In carrying out chemical plating of nickel onto a substrate, the bath should be maintained at a pH between 4.0 and 9.0. For optimum results, it is preferred to maintain the pH of the bath fairly constant at approximately 4.5-4.7. For the ***purpose of adjusting the pH during continuous plating operation with the bath***, acids such as sulfuric acid and alkaline materials such as ammonium hydroxide, sodium carbonate, for example can be used.

Accordingly, GB 1,243,134 discloses electrolytes that are not self-regulating with respect to pH, and in fact teaches away from this aspect of applicants' claim by disclosing that the pH is affirmatively adjusted during a continuous plating operation by additions of sulfuric acid and other exemplary compounds.

In view of the foregoing, applicants submit that the cited GB 1,243,134 reference does not render claim 48 obvious inasmuch as it does not disclose (1) the particular complexing agents required by claim 48, nor does it disclose (2) the self-regulating behavior of the electrolyte. Accordingly, applicants respectfully request that the rejection be withdrawn.

Pending dependent claims 49, 52, 53, 59, and 61 depend from claim 48 and are therefore patentable for the same reasons as claim 48 and by virtue of the additional requirements therein. Claims 50-51 and 60 have been canceled.

(B) Claims rejections over GB 1,243,134 in view of other references

Claims 54-55, 56-57, 58, 62-63, and 64 have been rejected over GB 1,243,134 in view of various secondary references. These claims are respectfully submitted to be patentable for the same reasons as claim 48, but have been canceled.

CONCLUSION

In view of the foregoing, applicants respectfully request reconsideration and allowance of the pending claims 48, 49, 52, 53, 59, 61, and 66.

Respectfully submitted,

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